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Math 3C   Fall 2014
Pre-lecture 3-2 Due: Beginning of lecture-Wednesday, October 22.

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This is to be done on your own paper. Please write your name (last name first) on the top right corner along with your discussion section number (B02, B03 etc) and "pre-lecture [number]" (in this case "pre-lecture 3-2").

This will be graded on effort and thoughtfulness, not on correctness. With that said, do not feel obligated to write more than necessary. This is intended for you to work on your own.

1. Recall that by 2^3 we mean $2^3 = (2)(2)(2)$ (which equals 8)

   (a) What is another way we could write 3^4? (other than 81)

   (b) What is another way we could write x^4? And how about x^6?

   (c) What's another way to write x^m where m is a positive integer?

2. Note that $2^4 2^2 = (2)(2)(2)(2) \cdot (2)(2) = 2^6$.

   (a) What is another way we could write $3^4 3^2$ with only one 3?

   (b) What is another way we could write $x^4 x^2$? And how about $x^5 x^7$?

   (c) What's another way to write $x^m x^n$ where m and n are positive integers? Your answer should be a kind of "additive identity".

3. Your answer in question 2(c) is true for positive integers m and n. We will assume that it is also true for all nonnegative integers.

   (a) Using this assumption and also assuming that $x \neq 0$, plug in $n = 0$ and $m = 1$ into your answer from question 2(c). With this in mind, what do you think that x^0 should equal?

   (b) Fact: The expression 0^0 does not really make sense and does not have a defined value.
   With this in mind, where do things break down in question 3(a) if $x = 0$.

4. Your answer in question 2(c) is true for all positive integers m and n. We will assume that it is also true for <u>all</u> integers.

   (a) Using this assumption and also assuming that $x \neq 0$, plug in $n = -m$ and $m = m$ into your answer from quesiton 2(c) (where m is a positive integer). With this in mind, what do you think that x^{-m} should equal?

   (b) Does your answer in question 4(a) make sense if $x = 0$?